What we claim is:

1. In a method for estimating the multi-path delays in a signal received at an antenna array of k antenna elements, comprising estimating an impulse response at each k antenna, generating a space-time impulse response, forming a covariance matrix and resolving the covariance matrix with a known antenna array manifold, the improvement comprising the step of resolving the covariance matrix with a fictitious antenna array manifold.

2. A method for estimating the multi-path delays τ_i in a signal using a spatially blind antenna array comprising k arbitrary antenna elements, comprising the steps of:

generating an impulse response h_k for each antenna element k in the antenna array;

determining a vectorized space-time impulse response I over the antenna array;

creating a covariance matrix C;

creating a fictitious array manifold A_f, wherein A_f is spatially blind and independent of the array characteristics; and

resolving the covariance matrix C with the fictitious manifold A_f to thereby estimate the multi-path delays τ_i independent of the array characteristics.

3. The method of Claim 2 wherein the impulse response estimate h_k is determined from the equation:

$$h_k = (ZZ^H)^{-1} Zr_k$$

where Z is a delay matrix and r_k is the column vector of the received signal at antenna element k of the antenna array, where k=1,2,...m.

4. The method of Claim 3 wherein the space-time impulse response vector I is formed by stacking the individual impulse response estimates h_k into a column vector.

5. The method of Claim 2 wherein the fictitious manifold A_f is the aggregate of all vectors:

$$a = \begin{bmatrix} a_1 \\ a_2 \\ . \\ . \\ a_m \end{bmatrix}$$, where a_k (k=1,2,...m) range over the set of complex numbers, where m is the number of antenna elements in the array.

6. The method of Claim 2 wherein the covariance matrix C is generated according to the following equation:

$$C = \sum I\, I^H .$$

7. The method of Claim 2, wherein the fictitious array manifold A_f is used to form the space-time manifold and the space-time manifold operates to resolve the multi-path delays

8. The method of Claim 2 wherein the step of resolving the covariance matrix C to determine multi-path delays τ_i uses the method of MUltiple SIgnal Classification (MUSIC) techniques.

9. The method of Claim 2 wherein the step of resolving the covariance matrix C to determine multi-path delays τ_i uses the Method of Alternating Projection (APM).

10. A method of estimating the multi-path delays τ_i of a sequence of j blocks of a signal received at an antenna array of k isotropic antenna elements, independently of the spatial array characteristics of the antenna array, comprising the steps of:

deriving channel impulse response estimates $h_{j,k}$ for each block j at each antenna k;

determining a vectorized aggregate space-time impulse response I for each block j;

forming an estimated covariance matrix for the sequence of j blocks;

providing an array manifold A_f void of spatial information; and,

resolving the covariance matrix with the array manifold A_f to determine the multi-path delays τ_i.

11. The method of 10, wherein the impulse response estimate $h_{j,k}$ for block j is determined from the equation:

$$h_{j,k} = (Z_j Z_j^H)^{-1} Z_j r_{j,k}$$

where Z_j is a delay matrix for block j and r_{jk} is the column vector of the received signal for block j at antenna k of the antenna array, where k=1,2,...m.

12. The method of 11, wherein the space-time impulse response vector I is formed by stacking the individual impulse response estimates h_{jk} into a column vector.

13. The method of 10, wherein the fictitious manifold A_f is the aggregate of all vectors:

$$a = \begin{bmatrix} a_1 \\ a_2 \\ \cdot \\ \cdot \\ a_m \end{bmatrix}$$, where a_k (k=1,2,...m) range over the set of complex numbers, where m is the number of an antenna element in the array.

14. The method of claim 10, wherein the covariance matrix C is generated according to the following equation:

$$C = \sum_{j=1}^{J} I_j I_j^H .$$

15. The method of Claim 10, wherein the fictitious array manifold A_f is used to form the space-time manifold and the space-time manifold operates to resolve the multi-path delays

16. The method of claim 10, wherein the step of resolving the covariance matrix C to determine multi-path delays τ_l uses multiple signal classification techniques.

17. The method of claim 10, wherein the step of resolving the covariance matrix C to determine multi-path delays τ_l uses Alternating Projection.

18. A system for estimating the multi-path delays τ_l in a signal using a spatially blind antenna array comprising:

an antenna array for receiving the signal;

a means for generating an impulse response h_k for each antenna k in the antenna array;

a means determining a vectorized space-time impulse response I over the antenna array;

a means for creating a covariance matrix C

a means for creating a fictitious manifold A_f, wherein A_f is spatially blind and independent of the array characteristics; and,

a means for resolving the covariance matrix C with the fictitious manifold A_f to estimate the multi-path delays τ_l independent of the array characteristics.

19. The system of Claim 18, wherein the fictitious array manifold A_f in part forms the space-time manifold and a space-time manifold operates to resolve the multi-path delays